

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

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Serial No.: Continuation of 10/006,915

Art Unit: Not Yet Assigned

Filed: February 6, 2004

Examiner: Not Yet Assigned

For: *BIOLOGICAL SYSTEMS FOR MANUFACTURE OF
POLYHYDROXYALKANOATE POLYMERS CONTAINING 4-HYDROXYACIDS*

Commissioner for Patents
P.O. Box 1450
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INFORMATION DISCLOSURE STATEMENT

Sir:

Pursuant to 37 C.F.R. §1.56 and 37 C.F.R. §1.97, Applicants submit an Information Disclosure Statement, including fifteen (15) pages of Form PTO-1449. All of the documents cited below were cited by or submitted to the Patent Office in Application Serial No. 10/006,915 filed November 9, 2001, to which the present application claims priority. Pursuant to 37 C.F.R. §1.98(d), Applicants are not enclosing copies of these publications. Copies will be provided upon request, however.

This Information Disclosure Statement is being filed under 37 C.F.R. § 1.97(b) prior to a first Office Action on the merits. It is believed that no fee is required with this submission. However, should a fee be required, the Commissioner is hereby authorized to charge any required fees to Deposit Account No. 50-1868.

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Remarks

This statement should not be interpreted as a representation that an exhaustive search has been conducted or that no better art exists. Moreover, Applicants invite the Examiner to make an independent evaluation of the cited art to determine its relevance to the subject matter of the present application. Applicants are of the opinion that their claims patentably distinguish over the art referred to herein, either alone or in combination.

Respectfully submitted,



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INFORMATION DISCLOSURE STATEMENT BY APPLICANT (use as many sheets as necessary)				Application Number	Continuation of 10/006,915
				Filing Date	February 6, 2004
				First Named Inventor	Gjalt W. Huisman
				Group Art Unit	
				Examiner Name	
Sheet 1 of 15	Attorney Docket Number MBX 017 CON (2)				

U.S. PATENT DOCUMENTS						
Examiner Initials*	Cite No. ¹	US Patent Document		Name of Patentee or Applicant of Cited Document	Date of Cited Document MM-DD-YYYY	Pages, Columns, Lines, Where Relevant Passages or Relevant Figures Appear
		Number	Kind Code ² (if known)			
		4,430,430		Momose, et al.	02-07-1989	
		4,876,331		Doi	10-24-1989	
		5,245,023		Peoples, et al.	09-14-1993	
		5,250,430		Peoples, et al.	10-05-1993	
		5,286,842		Kimura	02-15-1994	
		5,292,860		Shiotani et al.	03-08-1994	
		5,378,616		Tujimoto, et al.	01-03-1995	
		5,461,139		Gonda, et al.	10-24-1995	
		5,502,273		Bright, et al.	03-26-1996	
		5,516,883		Hori, et al.	05-14-1996	
		5,534,432		Peoples, et al.	07-09-1996	
		5,563,239		Hubbs, et al.	10-08-1996	
		5,602,321		John	02-11-1997	
		5,610,041		Somerville, et al.	03-11-1997	
		5,650,555		Somerville, et al.	07-22-1997	

FOREIGN PATENT DOCUMENTS								
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		5,663,063		People, et al.	09-02-1997	
		6,117,658		Dennis et al.	09-12-2000	

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		ABE, et al., "Biosynthesis from gluconate of a random copolyester consisting of 3-hydroxybutyrate and medium-chain-length 3-hydroxyalkanoates by <i>Pseudomonas</i> sp. 61-3," <i>Int. J. Biol. Macromol.</i> 16:115-119 (1994).	
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		BELL AND MALMBERG, "Analysis of a cDNA encoding arginine decarboxylase from oat reveals similarity to the <i>Escherichia coli</i> arginine decarboxylase and evidence of protein processing," <i>Mol. Gen. Genet.</i> 224:431 (1990).	

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		BENACHENHOU-LAHFA, et al., "PCR-mediated cloning and sequencing of the gene encoding glutamate dehydrogenase from the archaeon Sulfolobus shibatae: identification of putative amino-acid signatures for extremophilic adaptation," <i>Gene</i> 140: 17-24 (1994).	
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		Filing Date	February 6, 2004
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		CHU, et al., "Enzymatically active truncated cat brain glutamate decarboxylase: expression, purification, and absorption spectrum," <i>Arch. Biochem. Biophys.</i> 313:287-295 (1994).	
		COCK, et al., "A nuclear gene with many introns encoding ammonium-inducible chloroplastic NADP-specific glutamate dehydrogenase(s) in <i>Chlorella sorokiniana</i> ," <i>Plant Mol. Biol.</i> 17:1023-144 (1991).	
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		DOI, et al., "Nuclear Magnetic Resonance Studies on Unusual Bacterial Copolyesters of 3-Hydroxybutyrate and 4-Hydroxybutyrate," <i>Macromolecules</i> 21:2722-2727 (1988).	
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		GERNGROSS, et al., "Overexpression and purification of the soluble polyhydroxyalkanoate synthase from <i>Alcaligenes eutrophus</i> : evidence for a required posttranslational modification for catalytic activity," <i>Biochemistry</i> 33: 9311 (1994).	

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		GONZÁLEZ, et al., "Cloning of a yeast gene coding for the glutamate synthase small subunit (GUS2) by complementation of <i>Saccharomyces cerevisiae</i> and <i>Escherichia coli</i> glutamate auxotrophs," <i>Mol. Microbiol.</i> 6:301-308 (1992).	
		GREGERSON, et al., "Molecular characterization of NADH-dependent glutamate synthase from alfalfa nodules," <i>Plant Cell</i> 5:215 (1993).	
		HEIN, et al., "Biosynthesis of poly(4-hydroxybutyric acid) by recombinant strains of <i>Escherichia coli</i> ," <i>FEMS Microbiol. Lett.</i> 153:411-418 (1997).	
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		JOHNSTON, et al., "Complete nucleotide sequence of <i>Saccharomyces cerevisiae</i> chromosome VIII," <i>Science</i> 265:2077 (1994).	
		KANEKO, et al., "Sequence analysis of the genome of the unicellular cyanobacterium <i>Synechocystis</i> sp. strain PCC6803. II. Sequence determination of the entire genome and assignment of potential protein-coding regions," <i>DNA Res.</i> 3:109 (1996).	
		KATO, et al., "Open reading frame 3 of the barotolerant bacterium strain DSS12 is complementary with <i>cydD</i> in <i>Escherichia coli</i> : <i>cydD</i> functions are required for cell stability at high pressure," <i>J. Biochem.</i> 120:301 (1996).	

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		KATO, et al., "Production of a novel copolyester of 3-hydroxybutyric acid with a medium-chain-length 3-hydroxyalkanoic acids by <i>Pseudomonas</i> sp. 61-3 from sugars," <i>Appl. Microbiol. Biotechnol.</i> 45:363-70 (1996).	
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		Application Number	Continuation of 10/006,915
		Filing Date	February 6, 2004
		First Named Inventor	Gjalt W. Huisman
		Group Art Unit	
		Examiner Name	
Sheet 9 of 15	Attorney Docket Number	MBX 017 CON (2)	

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		LEE, et al., "Enhanced biosynthesis of P(3HB-3HV) and P(3HB-4HB) by amplification of the cloned PHB biosynthesis genes in <i>Alcaligenes eutrophus</i> ," <i>Biotechnol. Lett.</i> 19: 771-774 (1997).	
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		MILLER, et al., "Cloning and characterization of <i>gdhA</i> , the structural gene for glutamate dehydrogenase of <i>Salmonella typhimurium</i> ," <i>J. Bacteriol.</i> 157:171-178 (1984).	
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		OWEN & PEN, eds., <i>Transgenic Plants: A Production System for Industrial and Pharmaceutical Proteins</i> John Wiley & Sons Ltd: England, 1996.	

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				Gjalt W. Huisman	
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		PARK, et al., "Isolation and characterization of recombinant mitochondrial 4-aminobutyrate aminotransferase," <i>J. Biol. Chem.</i> 268: 7636-7639 (1993).	
		PELANDA, et al., "Glutamate synthase genes of the diazotroph <i>Azospirillum brasilense</i> . Cloning, sequencing, and analysis of functional domains," <i>J. Biol. Chem.</i> 268:3099 (1993).	
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		PERLAK, et al., "Modification of the coding sequence enhances plant expression of insect control protein genes," <i>Proc. Natl. Acad. Sci. USA</i> 88: 3324 (1991).	
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		POIRIER et al., "Polyhydroxybutyrate, a Biodegradable Thermoplastic Produced in Transgenic Plants," <i>Science</i> 256:520-523 (1992).	
		PRESECAN, et al., "The <i>Bacillus subtilis</i> genome from gerBC (311 degrees) to licR (334 degrees)," <i>Microbiology</i> 143:3313 (1997).	
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		REITZER, "Ammonia Assimilation and the Biosynthesis of Glutamine, Glutamate, Aspartate, Asparagine, L-Alanine, and D-Alanine," in <i>Escherichia coli and Salmonella</i> , (Neidhardt, ed.), pp. 391-407, ASM Press: Washington, D.C., 1996.	

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		SAITO & DOI, "Microbial synthesis and properties of poly(3-hydroxybutyrate-co-4-hydroxybutyrate) in Comamonas acidovorans," <i>Int. J. Biol. Macromol.</i> 16:18 (1994).	
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		SHAIBE, et al., "Control of Utilization of L-Arginine, L-Ornithine, Agmatine, and Putrescine as Nitrogen Sources in Escherichia coli K-12," <i>J. Bacteriol.</i> 163:938 (1995).	
		SMITH, et al., "Complete genome sequence of Methanobacterium thermoautotrophicum deltaH: functional analysis and comparative genomics," <i>J. Bacteriol.</i> 179:7135 (1997).	

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		SNEDECOR, et al., "Selection, expression, and nucleotide sequencing of the glutamate dehydrogenase gene of <i>Peptostreptococcus asaccharolyticus</i> ," <i>J. Bacteriol.</i> 173:6162-6167 (1991).	
		SÖHLING & GOTTSCHALK, "Molecular analysis of the anaerobic succinate degradation pathway in <i>Clostridium kluyveri</i> ," <i>J. Bacteriol.</i> 178:871-880 (1996).	
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		STIM & BENNETT, "Nucleotide sequence of the <i>adi</i> gene, which encodes the biodegradative acid-induced arginine decarboxylase of <i>Escherichia coli</i> ," <i>J. Bacteriol.</i> 175:1221 (1993).	
		STRAUB, et al., "Isolation, DNA sequence analysis, and mutagenesis of a proline dehydrogenase gene (<i>putA</i>) from <i>Bradyrhizobium japonicum</i> ," <i>Appl. Environ. Microbiol.</i> 62:221 (1996).	
		SVAB, et al., "Stable transformation of plasmids in higher plants," <i>Proc. Natl. Acad. Sci. USA.</i> 87: 8526-8530 (1990).	
		SYNTICHAKI, et al., "The amino-acid sequence similarity of plant glutamate dehydrogenase to the extremophilic archaeal enzyme conforms to its stress-related function," <i>Gene</i> 168: 87-92 (1996).	

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		SZUMANSKI & BOYLE, "Analysis and sequence of the speB gene encoding agmatine ureohydrolase, a putrescine biosynthetic enzyme in Escherichia coli," <i>J. Bacteriol.</i> 172:538, (1990).	
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		VALENTIN, et al., "Identification of 4-hydroxyhexanoic acid as a new constituent of biosynthetic polyhydroxyalkanoic acids from bacteria," <i>Appl. Microbiol. Biotechnol.</i> 40:710-16 (1994).	
		VALENTIN, et al., "Identification of 4-hydroxyvaleric acid as a constituent of biosynthetic polyhydroxyalkanoic acids from bacteria," <i>Appl. Microbiol. Biotechnol.</i> 36:507-14 (1992).	
		VALENTIN, et al., "Identification of 5-hydroxyhexanoic acid, 4-hydroxyheptanoic acid and 4-hydroxyoctanoic acid as new constituents of bacterial polyhydroxyalkanoic acids," <i>Appl. Microbiol. Biotechnol.</i> 46:261-67 (1996).	
		VALENTIN, et al., "Production of poly(3-hydroxybutyrate-co-4-hydroxybutyrate) in recombinant Escherichia coli grown on glucose," <i>J. Biotechnol.</i> 58: 33-38 (1997).	

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				Application Number	
				Continuation of 10/006,915	
				Filing Date	
				February 6, 2004	
				First Named Inventor	
Gjalt W. Hulsman					
Group Art Unit					
Examiner Name					
Attorney Docket Number					
MBX 017 CON (2)					

Sheet	15	of	15
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OTHER ART -- NON PATENT LITERATURE DOCUMENTS			
Examiner's Initials*	Cite No. ¹	Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc.), date, page(s), volume-issue number(s), publisher, city and/or country where published	T ²
		VALLE, et al., "Complete nucleotide sequence of the glutamate dehydrogenase gene from Escherichia coli K-12," <i>Gene</i> 27:193-199 (1984).	
		VALLE, et al., "Nucleotide sequence of the promoter and amino-terminal coding region of the glutamate dehydrogenase structural gene of Escherichia coli," <i>Gene</i> 23: 199-209 (1983).	
		WANG, et al., "In vivo cloning of proline genes and its expression in Escherichia coli," <i>Chin. J. Biotechnol.</i> 6:27 (1990).	
		WATSON, et al., "Isolation and Characterization of a Second Arginine Decarboxylase cDNA from Arabidopsis (Accession No. AF009647)," <i>Plant Physiol.</i> 114:1569 (1997).	
		WILLADSEN & BUCKEL, "Assay of 4-hydroxybutyryl-CoA dehydratase from <i>Clostridium aminobutyricum</i> ," <i>FEMS Microbiol. Lett.</i> 70:187-192 (1990).	
		WILLIAMS, et al., "Biodegradable plastics from plants," <i>CHEMTECH</i> 26:38-44 (1996).	
		WOLFF, et al., "Dehydrogenases involved in the conversion of succinate to 4-hydroxybutanoate by <i>Clostridium kluyveri</i> ," <i>Appl. Environ. Microbiol.</i> 59:1876-1882 (1993).	
		YEE, et al., "Isolation and characterization of a NADP-dependent glutamate dehydrogenase gene from the primitive eucaryote <i>Giardia lamblia</i> ," <i>J. Biol. Chem.</i> 267:7539-7544 (1992).	

Examiner's Signature	Date Considered
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